Prevent premature brake pad and disc wear

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Modern caliper disc brakes are designed to provide both static and dynamic brake torque for stopping and holding of the main hoist, trolley, boom hoist and gantry drives on container handling cranes. Static or holding torque is a result of a specific static coefficient of friction between the brake pads and a stationary drive disc. Dynamic brake torque depends upon a dynamic coefficient of friction between the pads and the disc so that when the brake pads contact a moving disc the drive rotational kinetic energy is dissipated as heat as the disc is stopped. When a particular drive disc is rotating with the associated brakes released, and no braking is required, the disc and brake pads must be free and clear of each other or abrasive wear of the disc and brake linings will occur.

Figure 1 displays a top view of a caliper disc brake on a main hoist of a container crane. The brake was set when the photo was taken. Note that there is a significant difference in the thickness of the brake pads, indicating that the pad on the left has been dragging on the moving disc with the brake released. This has resulted in abnormal left pad and left side disc wear, with significant reduction in usable brake pad and disc life. This is not only a costly problem requiring that the pads be changed too often, but also a dangerous one as it can lead to brake failure if not corrected. The brake pads must be adjusted for equal lift-off when the brake is electrically released (not with the brake manually released). On some brakes this adjustment is manual, on more modern brakes the adjustment is automatic, but in either case the equal lift-off function must be set-up correctly and checked periodically as described in the brake operation and maintenance manual.

The required brake pad lift-off on both sides of the disc is small, generally about 1mm to 1.25mm on each side, just enough to clear both pads from a static or moving disc.

The key word is EQUAL – there must be similar clearance on both sides between the pads and the disc with the brake electrically released to avoid premature pad and disc wear. A relatively easy way to check for equal pad lift-off is to look down on the electrically-released brake with the disc not moving and view the lift-off on both sides of the disc – preferably with a high intensity flashlight. The lift-off can also be measured with a steel ruler approximately 1mm thick. If the ruler can be passed between the pads and the disc without impediment, the lift-off is sufficient.

Keep friction working for you, not against you. Make sure your brake pads aren’t rubbing against a moving disc when your brakes are electrically released.